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<u>L4</u>	(portable adj1 (device or unit)) same display same (computer or dock\$3)	1409	<u>L4</u>
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<u>L3</u>	(portable adj1 (device or unit)) same display same (computer or dock\$3)	195	<u>L3</u>
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<u>L1</u>	(portable adj1 (device or unit)) same (primary adj1 display) same (secondary adj1 display) same (computer or dock\$3)	1	<u>L1</u>

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## Battery modeling for energy aware system design

Rao, R., Vrudhula, S., Raskimatoz, D.N.  
University of Arizona, Tucson

This paper appears in: **Computer**

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### Abstract

Advances in battery technology have not kept pace with rapidly growing energy demands. Most laptops, handheld PCs, and cell phones use batteries that take anywhere from 1.5 to 4 hours to fully charge but can run on this charge for only a few hours. The battery has thus become a key control parameter in the energy management of portables. To meet the stringent power budget of these devices, researchers have explored various architectural, hardware, software, and system-level optimizations to minimize the energy consumed per useful computation. Research in battery-aware optimization is now moving from stand-alone devices to networks of wireless devices, specifically, ad hoc and distributed sensor networks. Computationally feasible mathematical models are now available that capture battery discharge characteristics in sufficient detail to let designers develop an optimization strategy that extracts maximum charge.

Index Terms

Index

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ad hoc networks, cells (electric), cellular radio, energy conservation, load management, low-power electronics, power, utilization, telecommunication power supplies, wireless sensor networks

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ad hoc networks, battery modeling, battery technology, battery-aware optimization, distributed sensor networks, energy consumption, energy management, energy-aware system design, portable devices, system-level optimizations, wireless devices

### Author Keywords

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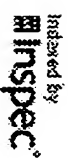
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<u>L6</u>	710/303-304.ccls. and ((portable adj1 (device or unit)) same display same (computer or dock\$3))	5	<u>L6</u>
<u>L5</u>	L4	92	<u>L5</u>
<u>L4</u>	710/303-304.ccls. and (portable same display same (computer or dock\$3))	92	<u>L4</u>
<u>L3</u>	710/303-304.ccls. and ("primary display" same "secondary display")	0	<u>L3</u>
<u>L2</u>	710/303-304.ccls. and "primary display" same "secondary display"	0	<u>L2</u>
<u>L1</u>	710/303-304.ccls. and (portable same display)	106	<u>L1</u>

END OF SEARCH HISTORY

## Refine Search

### Search Results -

Terms	Documents
((portable adj1 (device or unit)) same display same (computer adj1 system))	54

Database:

US Pre-Grant Publication Full-Text Database  
 US Patents Full-Text Database  
 US OCR Full-Text Database  
 EPO Abstracts Database  
 JPO Abstracts Database  
 Derwent World Patents Index  
 IBM Technical Disclosure Bulletins

Search:

L8

Refine Search

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### Search History

 DATE: Tuesday, July 19, 2005    [Printable Copy](#)    [Create Case](#)

<u>Set</u> <u>Name</u> side by side	<u>Query</u>	<u>Hit</u> <u>Count</u>	<u>Set</u> <u>Name</u> result set
<i>DB=USPT; PLUR=YES; OP=OR</i>			
<u>L8</u>	((portable adj1 (device or unit)) same display same (computer adj1 system))	54	<u>L8</u>
<u>L7</u>	((portable adj1 (device or unit)) same display same computer)	563	<u>L7</u>
<u>L6</u>	710/303-304.ccls. and ((portable adj1 (device or unit)) same display same (computer or dock\$3))	5	<u>L6</u>
<u>L5</u>	L4	92	<u>L5</u>
<u>L4</u>	710/303-304.ccls. and (portable same display same (computer or dock\$3))	92	<u>L4</u>
<u>L3</u>	710/303-304.ccls. and ("primary display" same "secondary display")	0	<u>L3</u>
<u>L2</u>	710/303-304.ccls. and "primary display" same "secondary display"	0	<u>L2</u>
<u>L1</u>	710/303-304.ccls. and (portable same display)	106	<u>L1</u>

END OF SEARCH HISTORY

## Refine Search

### Search Results -

Terms	Documents
(portable adj1 (device or unit)) same computer same display same (attach\$3 or insert\$3)	42

Database:

US Pre-Grant Publication Full-Text Database  
 US Patents Full-Text Database  
 US OCR Full-Text Database  
 EPO Abstracts Database  
 JPO Abstracts Database  
 Derwent World Patents Index  
 IBM Technical Disclosure Bulletins

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L1

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### Search History

 DATE: Tuesday, July 19, 2005    [Printable Copy](#)    [Create Case](#)

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Name    Query  
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Count    Set  
                     Name  
                     result set

DB=USPT; PLUR=YES; OP=OR

L1    (portable adj1 (device or unit)) same computer same display same (attach\$3 or  
 insert\$3)

 42    L1

END OF SEARCH HISTORY



## Refine Search

### Search Results -

Terms	Documents
(710/303  710/304).ccls. and ((portable adj1 (device or unit)) same computer)	29

Database:

US Pre-Grant Publication Full-Text Database  
 US Patents Full-Text Database  
 US OCR Full-Text Database  
 EPO Abstracts Database  
 JPO Abstracts Database  
 Derwent World Patents Index  
 IBM Technical Disclosure Bulletins

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L2

Refine Search

Recall Text

Clear

Interrupt

### Search History

 DATE: Tuesday, July 19, 2005    [Printable Copy](#)    [Create Case](#)

<u>Set Name</u> side by side	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u> result set
<i>DB=USPT; PLUR=YES; OP=OR</i>			
<u>L2</u>	710/303-304.ccls. and ((portable adj1 (device or unit)) same computer)	29	<u>L2</u>
<u>L1</u>	(portable adj1 (device or unit)) same computer same display same (attach\$3 or insert\$3)	42	<u>L1</u>

END OF SEARCH HISTORY

## Refine Search

### Search Results -

Terms	Documents
L4	92

Database:

US Pre-Grant Publication Full-Text Database  
 US Patents Full-Text Database  
 US OCR Full-Text Database  
 EPO Abstracts Database  
 JPO Abstracts Database  
 Derwent World Patents Index  
 IBM Technical Disclosure Bulletins

Search:

L5





### Search History

 DATE: Tuesday, July 19, 2005    [Printable Copy](#)    [Create Case](#)

#### Set Name Query

side by side

DB=USPT; PLUR=YES; OP=OR

L5    L4L4    710/303-304.ccls. and (portable same display same (computer or dock\$3))L3    710/303-304.ccls. and ("primary display" same "secondary display")L2    710/303-304.ccls. and "primary display" same "secondary display"L1    710/303-304.ccls. and (portable same display)

#### Hit Count Set Name

result set

92    L592    L40    L30    L2106    L1

END OF SEARCH HISTORY

[First Hit](#) [Fwd Refs](#)[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

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L5: Entry 89 of 92

File: USPT

Jun 21, 1994

DOCUMENT-IDENTIFIER: US 5323291 A

TITLE: Portable computer and docking station having an electromechanical docking/undocking mechanism and a plurality of cooperatively interacting failsafe mechanisms

Abstract Text (1):

A first embodiment of the present invention comprises a fully functional portable computer with central processing unit, hard disk drive data storage, and liquid crystal display and a docking station having at least a floppy disk drive, video random access memory and video controller. A motorized docking/undocking mechanism automatically docks and undocks the portable computer and docking station after the user has inserted the portable computer into the docking station or after the user has requested that the units be undocked. Numerous mechanical and electrical safeguards prevent the docking or undocking of the units if such docking or undocking is likely to lead to the loss of data or damage to the components of either unit. The internal mechanical construction of the docking station allows the user to place a large cathode ray tube display monitor directly atop the docking station without hindering the docking or undocking of the portable computer.

Brief Summary Text (5):

The dilemma posed to a consumer who desires the portability of a notebook computer and the full functionality of a desktop computer without the need of purchasing two separate systems has been recognized by the computer industry. One known solution is to offer a fully capable portable notebook computer which can be coupled to a separate stationary unit, the stationary unit frequently having additional data storage such as disk drives and additional display capabilities. These stationary units are commonly known as "docking stations".

Brief Summary Text (8):

The manner that screen displays integrate with known docking stations is also less than ideal. Typically the screen must remain separate from the docking station, as the portable computer itself forms the top surface of the two units when they are docked together. This increase in the "footprint" of the system is certainly undesirable.

Brief Summary Text (13):

In its first embodiment, the present invention comprises a portable computer with a liquid crystal display ("LCD"), hard disk drive storage, CPU and other supporting electronics and a docking station to which the portable computer can be coupled. Docking is accomplished by an electromechanical mating system which ensures reliable interconnection through a plurality of mechanical and electrical interlocks which prevent docking or undocking if certain conditions do not exist and which insure that docking will be accomplished in a simple and repeatable fashion if these prerequisites do exist.

Brief Summary Text (14):

The docking station is configured so that a large CRT display may be rested thereon without damaging the docking station or in any way impeding its functioning. The docking station initially comprises at least additional video memory and a floppy disk drive, as well as such input/output ("I/O") resources as video, sound, SCSI, etc. Providing these resources in the docking station allows the construction of a very small and lightweight portable computer. A floating point arithmetic co-processor can also be added to the docking station. Additional subsystems such as I/O bus subsystems compatible with the NUBUS.RTM. bus architecture and protocol established by Texas instruments. (NUBUS is a registered trademark owned by Texas Instruments) cards having a plurality of different functions and a hard disk drive storage unit can be added.

Detailed Description Text (4):

Portable computer 100 is shown in a front perspective in FIG. 1 and in a rear perspective in FIGS. 2 and 3. In this embodiment, computer 100 comprises display assembly 110 and base assembly 120. Display assembly 110 further comprises liquid crystal display ("LCD") panel 112, brightness controls 111 and contrast controls 113, and speaker 115. Latch 117 along the upper edge of display assembly 110, activated by latch button 118, is used to lock computer 100 in its closed position. Additionally, when display assembly 110 is in its closed position, latch 117 triggers a clamshell switch 101 (see FIG. 4) on the internal circuitry of computer 100, the switch signal indicating to the computer that it should place itself in a sleep state. Hinge assembly 119 allows display assembly 110 to open and close, as well as holding the display assembly open to the position chosen by the user.

Detailed Description Text (43):

FIG. 21 is a block diagram of the electronic components of docking station 500. As stated earlier, the purpose of the docking station is to add display, I/O, video random access memory ("VRAM"), NUBUS expansion possibilities, and, optionally, computational power to portable computer 100.

Detailed Description Text (56):

If the user attempts to insert computer 100 into docking station 500 while computer 100 is in a sleep state, no damage occurs to the computer, but the system is inoperable. Once inserted and an 'on' signal received, computer 100 will power up both CPU 210 and docking station 500 as previously described. Although the hardware used in this first embodiment permits full operation of the system with the portable computer coming out of a sleep state, the first embodiment's operating software cannot compensate for the change in display screens. Therefore, once computer 100 detects that it has been coupled to a docking station and that it has just come from a sleep state, it immediately returns to sleep, saving data, turning off the docking station and immediately ejecting the computer from the docking station. Once ejected, when computer 100's "on" key is pressed, LCD 110 will display a message requesting that the user order a full shutdown before attempting to dock the computer again.

Current US Cross Reference Classification (1):

710/303

CLAIMS:

1. A computing system comprising:

a portable computer comprising at least a central processing unit, a system address/data bus coupled to the central processing unit, random access memory coupled to the system bus, hard disk data storage coupled to the system bus, a liquid crystal display coupled to the system bus, a power controller coupled to the system bus, and a battery coupled to the power controller; and

a docking station detachably coupled via electrical connector means to the portable computer to provide increased video display capability and increased data storage, the docking station comprising at least an electromechanical docking/undocking means including an electric motor assembly for mechanically and electrically docking and undocking the portable computer to and from the docking station, floppy disk data storage means coupled through the electrical connector means to the system address/data bus for providing additional data storage when the portable computer is docked to the docking station, the electrical connector means coupled to the system address/data bus for displaying data from the portable computer on a cathode ray tube display when said portable computer is docked to the docking station, and a plurality of failsafe mechanisms disposed within the portable computer and the docking station and cooperatively interacting for protecting the portable computer and docking station from damage as docking and undocking occurs.

14. A computing system comprising:

a portable computer comprising at least a central processing unit, a system address/data bus coupled to the central processing unit, random access memory coupled to the system bus, hard disk data storage coupled to the system bus, a liquid crystal display coupled to the system bus, a power controller coupled to the system bus, and a battery coupled to the power controller; and

a docking station detachably coupled via electrical connector means to the portable computer to provide increased video display capability and increased data storage;

the electrical connector means comprising:

a docking connector allowing access to the portable computer's system address/data bus and a docking connector cover having a first position covering the docking connector and a second position uncovering the docking connector, the docking station further comprising a door block for detecting whether the docking connector cover is in the first position, said door block not permitting the portable computer to be docked to the docking station if the docking connector cover is in the first position, the door block permitting docking if the docking connector cover is in the second position;

the docking station comprising:

at least an electromechanical docking/undocking means including an electric motor assembly for mechanically and electrically docking and undocking the portable computer to and from the docking station,

floppy disk data storage means coupled through the electrical connector means to the system address/data bus for providing additional data storage when the portable computer is docked to the docking station,

the electrical connector means coupled to the system address/data bus for displaying data from the portable computer on a cathode ray tube display when said portable computer is docked to the docking station,

a plurality of failsafe mechanisms disposed within the portable computer and the docking station and cooperatively interacting for protecting the portable computer and docking station from damage as docking and undocking occurs, and

lock means disposed within said docking station for cooperatively securing insertion and removal of said portable computer from said docking station, said lock means having an unlocked position and a locked position, the lock means preventing the portable computer from being removed from the docking station if the portable computer is docked to the station and the lock means is in the locked position, said lock means further preventing the portable computer from being docked on the docking station when the portable computer is not docked to the station and said lock means is in the locked position by turning off the electromechanical docking/undocking means.

15. A portable computer and docking station wherein the portable computer is usable without being docked to the docking station and when docked to the docking station has increased data storage capabilities and increased video display capabilities, the portable computer comprising

a central processing unit;

a system bus for transmitting data and instructions coupled to the central processing unit;

random access memory coupled to the system bus;

liquid crystal display coupled to the system bus;

main system controller coupled to the system bus;

power controller coupled to the main system controller for controlling power usage in the portable computer and for controlling battery charging;

keyboard coupled to the power controller;

read only memory for storing system instructions coupled to the system bus; and

first docking connector coupled to the system bus and power controller; and the docking station comprising:

second docking connector for connecting to the first docking connector and allowing access to the portable computer's system bus;

electromechanical docking/undocking means including an electric motor assembly for electrically and mechanically coupling the first and second docking connectors together once the portable computer has been placed into the docking station;

docking station address and data bus coupled to the second docking connector;

video display system coupled to the docking station bus for display data processed in the portable computer on a cathode ray tube display;

on input/output (I/O) bus subsystem and protocol controller coupled to the docking station bus for allowing installation and use of I/O bus subsystem extension cards in the docking station;

floppy disk drive coupled to the docking station bus for allowing access to data stored on floppy disks by the portable computer when the portable computer is docked to the docking station; and

a plurality of electromechanical docking/undocking safety interlocks disposed within the portable computer and the docking station and cooperatively interacting for preventing the docking and undocking of the portable computer to and from the docking station if such docking and undocking would damage components in the docking station and the portable computer and cause the loss of data stored in the portable computer and the docking station.

28. A portable computer and docking station wherein the portable computer is usable without being docked to the docking station and when docked to the docking station has increased data storage capabilities and increased video display capabilities;

the portable computer comprising:

a central processing unit;

a system bus for transmitting data and instructions coupled to the central processing unit;

a random access memory coupled to the system bus;

a liquid crystal display coupled to the system bus;

a main system controller coupled to the system bus;

a power controller coupled to the main system controller for controlling power usage in the portable computer and for controlling battery charging;

a keyboard coupled to the power controller;

a read only memory for storing system instructions coupled to the system bus;

a first docking connector coupled to the system bus and power controller;

a docking connector door having a first position covering the first docking connector and a second position uncovering the first docking connector;

the docking station comprising:

a second docking connector for connecting to the first docking connector and allowing access to the portable computer's system bus;

a docking connector door block disposed on said docking station for preventing docking of the portable computer when the docking connector door is in the first position, said docking connector door block further permitting docking of the portable computer when the docking connector door is in the second position;

electromechanical docking/undocking means including an electric motor assembly for electrically and mechanically coupling the first and second docking connectors together after the portable computer has been placed into the docking station;

a docking station address and data bus coupled to the second docking connector;

video display system coupled to the docking station bus for display data processed in the portable computer on a cathode ray tube display;

an input/output (I/O) bus subsystem and protocol controller coupled to the docking station address and data bus for allowing installation and use of I/O bus subsystem expansion cards in the docking station;

a floppy disk drive coupled to the docking station address and data bus for allowing access to data stored on floppy disks by the portable computer when the portable computer is docked to the docking station;

a plurality of electromechanical docking/undocking safety interlocks disposed within the portable computer and the docking station and cooperatively interacting for preventing the docking and undocking of the portable computer to and from the docking station if such docking and undocking would damage components in the docking station and the portable computer and cause loss of data stored in the portable computer and the docking station, and

locking means for cooperatively securing insertion and removal of said portable computer from said docking station, the locking means preventing the portable computer from being docked to the docking station if the locking means is in the locked position by preventing the electromechanical docking/undocking means from turning on to dock the portable computer, said locking means further preventing the portable computer from being removed from the docking station when the portable computer is docked to the station and said lock means is in the locked position.

[Previous Doc](#)

[Next Doc](#)

[Go to Doc#](#)



[First Hit](#) [Fwd Refs](#)[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

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Print

L5: Entry 89 of 92

File: USPT

Jun 21, 1994

US-PAT-NO: 5323291

DOCUMENT-IDENTIFIER: US 5323291 A

TITLE: Portable computer and docking station having an electromechanical docking/undocking mechanism and a plurality of cooperatively interacting failsafe mechanisms

DATE-ISSUED: June 21, 1994

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Boyle; Dennis J.	Palo Alto	CA		
Herron; Matt	Menlo Park	CA		
Blakely; David	Mt. View	CA		
Johnson; Mary	San Jose	CA		
Halicho; James J.	Sunnyvale	CA		
Howard; Brian	Menlo Park	CA		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Apple Computer, Inc.	Cupertino	CA			02

APPL-NO: 07/ 961232 [\[PALM\]](#)

DATE FILED: October 15, 1992

INT-CL: [05] H05K 7/12, G06F 1/16

US-CL-ISSUED: 361/683; 361/686, 395/500, 395/800

US-CL-CURRENT: [361/686](#); [710/303](#)

FIELD-OF-SEARCH: 364/708, 364/708.1, 312/223.1, 312/223.2, 361/336-339, 361/380, 361/390-395, 361/399, 361/606-609, 361/679, 361/683-686, 361/725-727, 361/754, 361/759, 361/798

PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

Search Selected

Search All

Clear

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<a href="#">4742478</a>	May 1988	Nigro, Jr. et al.	364/708
<input type="checkbox"/>	<a href="#">4769764</a>	September 1988	Levanon	364/708
<input type="checkbox"/>	<a href="#">4969830</a>	November 1990	Daly et al.	361/394 X
<input type="checkbox"/>	<a href="#">5041924</a>	August 1991	Blackborow et al.	364/708 X
<input type="checkbox"/>	<a href="#">5175671</a>	December 1992	Sasaki	361/392
<input type="checkbox"/>	<a href="#">5199888</a>	April 1993	Condra et al.	361/380 X

ART-UNIT: 213

PRIMARY-EXAMINER: Picard; Leo P.

ASSISTANT-EXAMINER: Phillips; Michael W.

ATTY-AGENT-FIRM: Brooks; Jeffrey J.

ABSTRACT:

A first embodiment of the present invention comprises a fully functional portable computer with central processing unit, hard disk drive data storage, and liquid crystal display and a docking station having at least a floppy disk drive, video random access memory and video controller. A motorized docking/undocking mechanism automatically docks and undocks the portable computer and docking station after the user has inserted the portable computer into the docking station or after the user has requested that the units be undocked. Numerous mechanical and electrical safeguards prevent the docking or undocking of the units if such docking or undocking is likely to lead to the loss of data or damage to the components of either unit. The internal mechanical construction of the docking station allows the user to place a large cathode ray tube display monitor directly atop the docking station without hindering the docking or undocking of the portable computer.

28 Claims, 21 Drawing figures

[Previous Doc](#)

[Next Doc](#)

[Go to Doc#](#)

[First Hit](#) [Fwd Refs](#)[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

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L2: Entry 26 of 29

File: USPT

Jan 28, 1997

DOCUMENT-IDENTIFIER: US 5598539 A

TITLE: Apparatus and method for achieving hot docking capabilities for a dockable computer system

Brief Summary Text (4):

A dockable computer system includes a portable computer, usually a notebook or laptop, and a stationary or base computer unit having a docking station for receiving the portable unit. Dockable computer systems may be operated in a docked state, in which both computer units are physically associated as a generally unified system, or the remote unit may be separated from its host for independent operation in an undocked state.

Current US Original Classification (1):710/304[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

[First Hit](#) , [Fwd Refs](#)[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

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L2: Entry 26 of 29

File: USPT

Jan 28, 1997

US-PAT-NO: 5598539

DOCUMENT-IDENTIFIER: US 5598539 A

TITLE: Apparatus and method for achieving hot docking capabilities for a dockable computer system

DATE-ISSUED: January 28, 1997

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gephardt; Douglas D.	Austin	TX		
Swanstrom; Scott	Cedar Park	TX		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Advanced Micro Devices, Inc.	Sunnyvale	CA			02

APPL-NO: 08/ 553196 [\[PALM\]](#)

DATE FILED: November 7, 1995

## PARENT-CASE:

RELATED APPLICATION This is a Continuation of application Ser. No. 08/217,951 filed Mar. 25, 1994 abandoned. The present application is co-pending related to U.S. patent application Ser. No. 08/217,952, filed Mar. 25, 1994, entitled "A Dockable Computer System Capable of Electric and Electromagnetic Communication." The present application is also related to U.S. co-pending application Ser. No. 08/255,663 filed by Gephardt et al. on Jun. 9, 1994, and U.S. co-pending application Ser. No. 08/280,314 filed by Gephardt et al. on Jul. 26, 1994.

INT-CL: [06] [G06 F 13/20](#)

US-CL-ISSUED: 395/281; 395/283, 364/DIG.1

US-CL-CURRENT: [710/304](#)

FIELD-OF-SEARCH: 395/500, 395/283, 395/281, 395/306, 395/309

PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

Search Selected

Search ALL

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	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<a href="#">4530069</a>	July 1985	Desrochers	395/822
<input type="checkbox"/>	<a href="#">4769764</a>	September 1988	Levanon	361/680
<input type="checkbox"/>	<a href="#">4835737</a>	May 1989	Herrig et al.	395/283
<input type="checkbox"/>	<a href="#">4969830</a>	November 1990	Daly et al.	439/136

<input type="checkbox"/> 5030128	July 1991	Herron et al.	439/372
<input type="checkbox"/> 5052943	October 1991	Davis	439/357
<input type="checkbox"/> 5126954	June 1992	Morita	361/683
<input type="checkbox"/> 5175671	December 1992	Sasaki	361/686
<input type="checkbox"/> 5187645	February 1993	Spalding et al.	361/686
<input type="checkbox"/> 5195183	March 1993	Miller et al.	395/200.02
<input type="checkbox"/> 5241542	August 1993	Natarajan et al.	370/95.3
<input type="checkbox"/> 5265238	November 1993	Canova, Jr. et al.	395/500
<input type="checkbox"/> 5272584	December 1993	Austruy et al.	361/58
<input type="checkbox"/> 5317697	May 1994	Husak et al.	395/283
<input type="checkbox"/> 5323291	June 1994	Boyle et al.	361/686
<input type="checkbox"/> 5386567	January 1995	Lien et al.	395/700
<input type="checkbox"/> 5394552	February 1995	Shirota	395/750
<input type="checkbox"/> 5454080	September 1995	Fasig et al.	395/283
<input type="checkbox"/> 5463742	October 1995	Kobayashi	395/281
<input type="checkbox"/> 5483419	January 1996	Kaczeus, Sr. et al.	361/685

## FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
0637793	February 1995	EP	
9209029	May 1992	WO	

## OTHER PUBLICATIONS

HPSIR, Special Infrared Communications Specification, introduction pages and pp. 1-9.

ART-UNIT: 235

PRIMARY-EXAMINER: Lall; Parshotam S.

ASSISTANT-EXAMINER: Vu; Viet

ATTY-AGENT-FIRM: Foley & Lardner

## ABSTRACT:

A dockable computer system is capable of performing hot docking or warm docking. Hot docking refers to an ability to dock when the portable computer or docking station are running at full power. Warm docking refers to an ability to dock when the portable computer and docking station are running in a reduced power state. The dockable computer system employs a docking agent which is capable of quieting (rendering inactive) the buses of the portable computer and docking station in response to a notice signal. The notice signal is indicative of a change of states from the undocked state to the docked state or from the docked state to the undocked state. The notice signal can be provided from software, a user-actuated switch, or an infrared signal. The docking agent preferably quiets the system bus by idling the system bus or asserting bus ownership or bus mastership over the system bus. The docking agent is able to assert bus ownership or bus mastership over the system bus. Alternatively, the docking agent can perform a software idle subroutine or an interrupt subroutine which idles the system bus. Preferably, the system bus is idled by disabling clock signals to it. Preferably, the docking agent also removes bus ownership requests, interrupt requests, and DMA requests from the

station bus and system bus.

21 Claims, 3 Drawing figures

[Previous Doc](#)

[Next Doc](#)

[Go to Doc#](#)

[First Hit](#)   [Previous Doc](#)   [Next Doc](#)   [Go to Doc#](#)☐ [Generate Collection](#) [Print](#)

L5: Entry 1 of 4

File:. PGPB

Mar 24, 2005

DOCUMENT-IDENTIFIER: US 20050064926 A1

TITLE: Methods and systems for replaying a player's experience in a casino environment

Detail Description Paragraph:

[0065] Sally agrees and is debited 1 credit. Sally and her family watch a video recording of her reaction on the secondary display as the cards are dealt on the primary display. On each display, once the replay begins, large, bold text reading "Aug. 1, 2003" is superimposed; additionally, audio of a voice saying "Here's a replay of your BIG WIN!" is output repeatedly by the gaming machine's speakers.

Detail Description Paragraph:

[0145] The processor 255 may also be in communication with one or more other output devices besides the display device, for outputting information (e.g. to a player or another device). Such other one or more output devices may also be components of a gaming device. Such other one or more output devices may comprise, for example, an audio speaker (e.g. for outputting an outcome or information related thereto, in addition to or in lieu of such information being output via a display device), an infra-red transmitter, a radio transmitter, an electric motor, a printer (e.g., such as for printing cashless gaming vouchers), a coupon or product dispenser, an infra-red port (e.g., for communicating with a second gaming device or a portable device of a player), a Braille computer monitor, and a coin or bill dispenser. For gaming devices, common output devices include a cathode ray tube (CRT) monitor on a video poker machine, a bell on a gaming device (e.g. rings when a player wins), an LED display of a player's credit balance on a gaming device, an LCD display of a personal digital assistant (PDA) for displaying keno numbers.

Detail Description Paragraph:

[0146] The display device may comprise, for example, one or more display areas. For example, one of the display areas (e.g., a "primary" display screen) may display outcomes of current game plays games played on the gaming device. Another of the display areas (e.g., a "secondary" display screen) may display outcomes of prior game plays, video recordings of a player's reaction, and so on. Yet another of the display areas may display the benefits obtainable by playing a game of the gaming device (e.g., in the form of a payout table). In one or more embodiments, the gaming device may include more than one display device, one or more other output devices, or a combination thereof (e.g., two display devices and two audio speakers).

[Previous Doc](#)   [Next Doc](#)   [Go to Doc#](#)



[First Hit](#)   [Previous Doc](#)   [Next Doc](#)   [Go to Doc#](#)☐ [Generate Collection](#) [Print](#)

L5: Entry 1 of 4

File: PGPB

Mar 24, 2005

PGPUB-DOCUMENT-NUMBER: 20050064926

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20050064926 A1

TITLE: Methods and systems for replaying a player's experience in a casino environment

PUBLICATION-DATE: March 24, 2005

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Walker, Jay S.	Ridgefield	CT	US	
Jorasch, James A.	New York	NY	US	
Tedesco, Robert C.	Huntington	CT	US	
Tedesco, Daniel E.	Huntington	CT	US	
Gelman, Geoffrey M.	Boston	MA	US	
Fincham, Magdalena M.	Ridgefield	CT	US	

APPL-NO: 10/ 946496 [\[PALM\]](#)  
DATE FILED: September 21, 2004

## RELATED-US-APPL-DATA:

Application 10/946496 is a continuation-in-part-of US application 10/176765, filed June 20, 2002, PENDING

Application is a non-provisional-of-provisional application 60/299870, filed June 21, 2001,  
Application is a non-provisional-of-provisional application 60/504880, filed September 22, 2003,INT-CL: [07] [A63](#) [F](#) [9/24](#)

US-CL-PUBLISHED: 463/016

US-CL-CURRENT: [463/16](#)

REPRESENTATIVE-FIGURES: 8

## ABSTRACT:

A method and system is provided wherein an event experienced by a player is documented and the documentation of the event is stored (e.g., in association with an indication of the event). One example of an event experienced by a player is an outcome obtained by a player on a gaming device. In such an embodiment the documentation of the event may comprise an image of the player's reaction to the outcome and/or a still or video image of the outcome. In accordance with some embodiments of the present invention a player may subsequently access (e.g., purchase) an output of the documentation. In one embodiment an outcome of a prior game play that was documented is replayed. When the outcome of the prior game play is output, the outcome may be output in a manner that indicates to a viewer that the outcome is an outcome of a prior game play and not an outcome of a current game play.

[0001] This application claims the benefit of provisional application Ser. No. 60/504,880, filed Sep. 22, 2003 in the name of Walker et al. and entitled SYSTEM AND METHOD FOR STORING AND DISPLAYING GAME DATA. The entire content of this application is incorporated by reference

herein for all purposes.

[0002] This application is a continuation-in-part application of U.S. application Ser. No. 10/176,765, filed Jun. 20, 2002 in the name of Walker et al. and entitled METHODS AND SYSTEMS FOR DOCUMENTING A PLAYER'S EXPERIENCE IN A CASINO ENVIRONMENT, which Application claims the benefit of provisional patent application Ser. No. 60/299,870, filed Jun. 21, 2001, entitled "POST TRIP EXPERIENCE". The entire content of each of these applications is incorporated by reference herein for all purposes.

#### CROSS-REFERENCE TO RELATED APPLICATIONS

[0003] This application is related to the following co-pending, commonly-owned U.S. Patent Applications:

[0004] (i) U.S. Patent Application Ser. No. 60/298,482, entitled METHOD AND APPARATUS FOR PLANNING AND CUSTOMIZING A GAMING EXPERIENCE, filed Jun. 15, 2002 in the name of Walker et al., and which claims the benefit of U.S. Provisional Application No. 60/298,482, which was filed Jun. 15, 2001;

[0005] (ii) U.S. patent application Ser. No. 10/121,263, entitled METHOD AND APPARATUS FOR REMOTELY CUSTOMIZING A GAMING DEVICE, and filed Apr. 11, 2002 in the name of Walker et al., which claims the benefit of U.S. Provisional Application No. 60/283,086, filed Apr. 11, 2001; and

[0006] (iii) U.S. patent application Ser. No. 10/001,089, entitled GAMING DEVICE FOR A FLAT RATE PLAY SESSION AND METHOD OF OPERATING SAME, and filed Nov. 2, 2001 in the name of Walker et al., which claims the benefit of U.S. Provisional Application No. 60/282,792, entitled GAMING CONTRACTS and filed Apr. 11, 2001, and which is a Continuation-In-Part Application of U.S. patent application Ser. No. 09/518,760, entitled GAMING DEVICE FOR A FLAT RATE PLAY SESSION AND A METHOD OF OPERATING SAME and filed Mar. 3, 2000, which in turn a Continuation Application of U.S. patent application Ser. No. 08/880,838, entitled GAMING DEVICE FOR A FLAT RATE PLAY SESSION AND A METHOD OF OPERATING SAME and filed Jun. 23, 1997.

[Previous Doc](#)

[Next Doc](#)

[Go to Doc#](#)

[First Hit](#) [Fwd Refs](#)[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

End of Result Set



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L5: Entry 4 of 4

File: USPT

Jan 25, 2005

DOCUMENT-IDENTIFIER: US 6848058 B1

TITLE: Power reduction circuit and method with multi clock branch control

Brief Summary Text (4):

Portable electronic devices such as notebook computers, personal organizers, portable telecommunication equipment and other electronic devices consume much power during their display mode. By way of example, graphics control chips for laptop computers may be integrated circuits having synchronous dynamic ram (SDRAM) on the same die as the memory controller, other video and graphics processors, and central processing units if desired. For example, a conventional type of graphics control circuit may include a number of memory access request circuits (or access request engines) such as a video capture engine, a two dimensional and three dimensional drawing engine, a display engine, a video playback engine, a host processor, onboard SDRAM, SGRAM or other RAM serving as the frame buffer memory, a memory controller and a phase lock loop circuit (PLL) for generating a memory clock. As known in the art, each engine may have another clock, other than the memory clock, such as from another PLL or external clock, creating a clock boundary. Graphics control chips typically also include another phase lock loop circuit for generating a clock for a display device (or devices) such as a CRT that may plug into the laptop computer or an LCD display that is mounted to the laptop computer. A central processing unit (CPU) of the computer interfaces with the graphics chip and other peripheral devices as known in the art. A laptop computer or a portable device may include a TV tuner or video decoder, as part of a multimedia package, that sends video information to the video capture engine for eventual display on the LCD display after being stored in the memory.

Detailed Description Text (13):

By way of illustration, AND circuit 322a receives condition data CRT controller (CRTC) enable data, which may be, for example, a register bit indicating that a cathode ray tube has been enabled as the primary display device using the primary CRTC. The CRTC enable data is indicated as condition data 324a. Similarly, where a plurality of displays are connected for use, another AND circuit 322b may receive second CRTC enable data 324b indicating that a secondary display has been selected so that the graphics processor will output display data to two different display units using two different CRTC's (or any other suitable display controllers). Since display units may be of different types, additional condition data may be logically coupled as being required before the memory clock to that engine is disabled during normal operation. As shown in FIG. 3, a half frame buffer signal 326 may serve as an input through an OR circuit 328 whose output serves as condition data 324b. As such, it will be recognized that additional condition data may be logically configured to provide a suitable enabling or disabling of a memory clock to a selected processing engine as desired.

[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

[First Hit](#) [Fwd Refs](#)[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)[End of Result Set](#)

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L5: Entry 4 of 4

File: USPT

Jan 25, 2005

US-PAT-NO: 6848058

DOCUMENT-IDENTIFIER: US 6848058 B1

TITLE: Power reduction circuit and method with multi clock branch control

DATE-ISSUED: January 25, 2005

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sinclair; David E.	Markham			CA
Young; Eric	Scarborough			CA
Haouili; Sami J.	Toronto			CA

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
ATI International SRL	Christchurch			BB	03

APPL-NO: 09/ 325882 [\[PALM\]](#)

DATE FILED: June 4, 1999

INT-CL: [07] [G06 F 1/26](#)

US-CL-ISSUED: 713/322; 713/501

US-CL-CURRENT: [713/322](#); [713/501](#)

FIELD-OF-SEARCH: 713/322, 713/501, 307/31, 307/39

PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

☐ Search Selected☐ Search All☐ Clear

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<a href="#">5544101</a>	August 1996	Houston	327/407
<input type="checkbox"/>	<a href="#">5675808</a>	October 1997	Gulick et al.	395/750
<input type="checkbox"/>	<a href="#">5781768</a>	July 1998	Jones, Jr.	713/501
<input type="checkbox"/>	<a href="#">6256743</a>	July 2001	Lin	713/310
<input type="checkbox"/>	<a href="#">6263448</a>	July 2001	Tsern et al.	713/501
<input type="checkbox"/>	<a href="#">6307281</a>	October 2001	Houston	307/31

ART-UNIT: 2182

PRIMARY-EXAMINER: Gaffin; Jeffrey

ASSISTANT-EXAMINER: Kim; Harold

ATTY-AGENT-FIRM: Vedder, Price, Kaufman & Kammholz, P.C.

ABSTRACT:

A power consumption reduction circuit and method utilizes a memory clock source and a memory clock divider circuit that generates divided memory clock output signals as a plurality of corresponding independent clock signals to a number of different processing engines. A memory clock divider circuit and method selectively activates a plurality of independent clock signals in response to received condition data. In one embodiment, an engine clock source is also coupled through a switching circuit such that it is selectively output to one or more processing engines. The switching circuit disables the output from the engine clock based on register condition data. In another embodiment, a plurality of memory read latch circuits are controlled by a memory read latch control circuit. The memory read latch control circuit is operative to dynamically activate and deactivate the plurality of memory read latches based on detected memory read requests to facilitate memory access activity-based power reduction.

27 Claims, 3 Drawing figures

[Previous Doc](#)

[Next Doc](#)

[Go to Doc#](#)

## Refine Search

### Search Results -

Terms	Documents
L4 and ((primary adj1 display) same (secondary adj1 display))	0

Database:

US Pre-Grant Publication Full-Text Database  
 US Patents Full-Text Database  
 US OCR Full-Text Database  
 EPO Abstracts Database  
 JPO Abstracts Database  
 Derwent World Patents Index  
 IBM Technical Disclosure Bulletins

Search:

L6

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### Search History

 DATE: Tuesday, July 19, 2005    [Printable Copy](#)    [Create Case](#)

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Count    Set  
                  Name  
                  result set

*DB=EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR*
L6    L4 and ((primary adj1 display) same (secondary adj1 display))

 0    L6
*DB=PGPB,USPT,USOC; PLUR=YES; OP=OR*
L5    L4 and ((primary adj1 display) same (secondary adj1 display))

 4    L5
L4    (portable adj1 (device or unit)) same display same (computer or dock\$3)

 1409    L4
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L3    (portable adj1 (device or unit)) same display same (computer or dock\$3)

 195    L3
L2    L1

 0    L2
*DB=PGPB,USPT,USOC; PLUR=YES; OP=OR*
L1    (portable adj1 (device or unit)) same (primary adj1 display) same (secondary adj1 display) same (computer or dock\$3)

 1    L1

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[First Hit](#) [Fwd Refs](#)[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

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Generate Collection

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L7: Entry 66 of 66

File: USPT

Jun 25, 1974

DOCUMENT-IDENTIFIER: US 3819862 A

TITLE: COMMUNICATION SYSTEM WITH PORTABLE UNITS CONNECTED THROUGH A COMMUNICATION CHANNEL TO A COMPUTER FOR APPLYING INFORMATION THERETO

Abstract Text (1):

System for indicating the condition of hotel rooms or the like having a computer coupled to a memory and to display devices, with a communication channel extending from the computer to remote points, such as individual hotel rooms. A portable unit is carried by a maid or other personnel and is adapted to be coupled to a communication channel which may be present for another purpose. For example, the communication channel may be the telephone lines which provide telephone service to the rooms, a television antenna cable, or any other communication channel which is available. The portable unit includes a circuit for transmitting and receiving signals, and switches coupled thereto. When used with a telephone line, the portable units can be coupled thereto through an acoustic coupler, or a receptacle can be provided for the unit which is directly wired to the line. The portable unit or the receptacle can also include a circuit which is uniquely wired or switched for each room, so that a signal can be sent on the line which identifies the room and the particular portable unit, and which provides information representing the operation of the switches of the portable unit. The portable unit may include batteries for energization of the circuit therein. The information supplied on the communications line is coupled to the computer and stored in the memory thereof, and selectively read out on a visible display and/or printer as desired.

[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)



[First Hit](#) [Fwd Refs](#)[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

End of Result Set

☐ [Generate Collection](#) [Print](#)

L7: Entry 66 of 66

File: USPT

Jun 25, 1974

US-PAT-NO: 3819862

DOCUMENT-IDENTIFIER: US 3819862 A

TITLE: COMMUNICATION SYSTEM WITH PORTABLE UNITS CONNECTED THROUGH A COMMUNICATION CHANNEL TO A COMPUTER FOR APPLYING INFORMATION THERETO

DATE-ISSUED: June 25, 1974

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hedges; Walter Paul	Phoenix	AZ		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Motorola, Inc.	Franklin Park	IL			02

APPL-NO: 05/ 216678 [\[PALM\]](#)

DATE FILED: January 10, 1972

INT-CL: [ ] H04m 11/00

US-CL-ISSUED: 179/2A; 179/2DP, 340/153, 340/312, 340/286

US-CL-CURRENT: [379/93.37](#); [340/286.08](#), [340/825.29](#), [379/93.17](#)

FIELD-OF-SEARCH: 179/2DP, 179/15AL, 179/2A, 179/18BF, 340/311, 340/312, 340/153, 340/286, 178/66, 178/69.5R, 325/320, 325/30

PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

[Search Selected](#)[Search All](#)[Clear](#)

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<a href="#">3263185</a>	July 1966	Lender	325/30
<input type="checkbox"/>	<a href="#">3516062</a>	June 1970	Spraker	179/2DP
<input type="checkbox"/>	<a href="#">3588365</a>	June 1971	McNeilly et al.	179/15AL
<input type="checkbox"/>	<a href="#">3597539</a>	August 1971	Clark	178/69.5R
<input type="checkbox"/>	<a href="#">3675204</a>	July 1972	Miehle et al.	340/153
<input type="checkbox"/>	<a href="#">3684832</a>	August 1972	Marguth	179/2DP

ART-UNIT: 235

PRIMARY-EXAMINER: Claffy; Kathleen H.

ASSISTANT-EXAMINER: Faber; Alan

ATTY-AGENT-FIRM: Rauner; Vincent J. Stevens; Kenneth R.

ABSTRACT:

System for indicating the condition of hotel rooms or the like having a computer coupled to a memory and to display devices, with a communication channel extending from the computer to remote points, such as individual hotel rooms. A portable unit is carried by a maid or other personnel and is adapted to be coupled to a communication channel which may be present for another purpose. For example, the communication channel may be the telephone lines which provide telephone service to the rooms, a television antenna cable, or any other communication channel which is available. The portable unit includes a circuit for transmitting and receiving signals, and switches coupled thereto. When used with a telephone line, the portable units can be coupled thereto through an acoustic coupler, or a receptacle can be provided for the unit which is directly wired to the line. The portable unit or the receptacle can also include a circuit which is uniquely wired or switched for each room, so that a signal can be sent on the line which identifies the room and the particular portable unit, and which provides information representing the operation of the switches of the portable unit. The portable unit may include batteries for energization of the circuit therein. The information supplied on the communications line is coupled to the computer and stored in the memory thereof, and selectively read out on a visible display and/or printer as desired.

28 Claims, 11 Drawing figures

[Previous Doc](#)

[Next Doc](#)

[Go to Doc#](#)

[First Hit](#) [Fwd Refs](#)[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

Generate Collection

Print

L7: Entry 59 of 66

File: USPT

Oct 11, 1994

US-PAT-NO: 5355278

DOCUMENT-IDENTIFIER: US 5355278 A

TITLE: Portable electronic apparatus having an electro-magnetic shield supporting a keyboard

DATE-ISSUED: October 11, 1994

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hosoi; Takashi	Tokyo			JP
Ohgami; Keizo	Tokyo			JP
Takeda; Fumiaki	Tokyo			JP

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Kabushiki Kaisha Toshiba	Tokyo			JP	03

APPL-NO: 08/ 032189 [\[PALM\]](#)

DATE FILED: March 15, 1993

## PARENT-CASE:

This is a continuation of application Ser. No. 07/935,252, filed on Aug. 27, 1992, which was abandoned upon filling hereof which in turn, is a divisional of application Ser. No. 07/695,501, filed May 6, 1991, now U.S. Pat. No. 5,255,154.

## FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
JP	2-115810	May 7, 1990

INT-CL: [05] H05K 7/02, H05K 9/00

US-CL-ISSUED: 361/680; 361/818

US-CL-CURRENT: [361/680](#); [361/818](#)

FIELD-OF-SEARCH: 364/708, 364/708.1, 200/5A, D4/356C, D4/35R, 361/380, 361/390-395, 361/399, 361/424, 361/680-686, 361/816, 361/818, 361/758

## PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

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	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<a href="#">2557670</a>	June 1951	Luft	70/72
<input type="checkbox"/>	<a href="#">3392556</a>	July 1968	Atkinson	70/71

<input type="checkbox"/> 3545238	December 1970	Gehrie et al.	70/74 X
<input type="checkbox"/> 4363226	December 1982	Remington et al.	70/312 X
<input type="checkbox"/> 4366685	January 1983	Remington	70/312
<input type="checkbox"/> 4395892	August 1983	Remington	70/69 X
<input type="checkbox"/> 4416126	November 1983	Remington	70/71
<input type="checkbox"/> 4479198	October 1984	Romano et al.	
<input type="checkbox"/> 4494095	January 1985	Noji et al.	361/424 X
<input type="checkbox"/> 4547006	October 1985	Castanier	70/71 X
<input type="checkbox"/> 4560845	December 1985	Takamura et al.	200/54
<input type="checkbox"/> 4574601	March 1986	Werk et al.	70/708
<input type="checkbox"/> 4602164	July 1986	Gore, III et al.	361/424 X
<input type="checkbox"/> 4648128	March 1987	Saka et al.	361/424 X
<input type="checkbox"/> 4671688	June 1987	Brashears	
<input type="checkbox"/> 4717989	January 1988	De Barros et al.	361/424
<input type="checkbox"/> 4744005	May 1988	Milani	
<input type="checkbox"/> 4751872	June 1988	Lawson, Jr.	
<input type="checkbox"/> 4769764	September 1988	Levanon	
<input type="checkbox"/> 4842531	June 1989	Takemura	
<input type="checkbox"/> 4858162	August 1989	Kieffer et al.	364/708
<input type="checkbox"/> 4864523	September 1989	Sasaki	364/708
<input type="checkbox"/> 4894792	January 1990	Mitchell et al.	364/708
<input type="checkbox"/> 4941841	July 1990	Darden et al.	364/708 X

## FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
0066664	May 1981	EP	
0189796	August 1986	EP	
8625029	January 1987	DE	
8625029	January 1987	DE	
2-65384	May 1990	JP	
2031055	October 1978	GB	
2202381	September 1988	GB	

## OTHER PUBLICATIONS

Electronics, vol. 16, No. 16, Oct. 1988, Hasbrouck Heighers, N.J. pp. 107-109, "PC-Board Suppliers Look for Material and Design Gains".

IBM Technical Disclosure Bulletin, vol. 32, No. 1, Jun. 1989, N.Y., pp. 74-75, "Self-Aligning Connector".

"Reference Manual", Toshiba T5200 Portable Personal Computer, No. PAD8849-1, pp. IV-VIII and 3/24-3/29, no date given.

"Reference Manual", Toshiba T3100e Portable Personal Computer, No. PAD8685-3, pp. IV-VIII and 5/18-5/29, no date given.

IBM Technical Disclosure Bulletin, vol. 32, No. 1, Jun. 1989, N.Y., pp. 74-75, "Self-Aligning Connector".

ART-UNIT: 213

PRIMARY-EXAMINER: Picard; Leo P.

ASSISTANT-EXAMINER: Phillips; Michael W.

ATTY-AGENT-FIRM: Cushman, Darby & Cushman

ABSTRACT:

A portable computer includes a housing and a display unit. The display unit is attached to the housing to be movable between a closed position and an opened position. The portable unit may also include a keyboard which can be covered by the display when the display is in the closed position. A circuit board is proximate to the bottom wall of the housing. A shield plate for magnetically shielding the circuit board is disposed inside the housing proximate to the circuit board and can be between the circuit board and the keyboard if a keyboard is provided. At least one supporting member extends from the bottom face of the shielding plate and abuts the circuit board to prevent the keyboard unit, if one is provided, from bending toward the circuit board. The shield plate may include an edge which is supported on the housing. The portable computer may also include bosses positioned between the bottom wall of the housing and the circuit board.

20 Claims, 16 Drawing figures

[Previous Doc](#) . [Next Doc](#) [Go to Doc#](#)

[First Hit](#) [Fwd Refs](#)[Previous Doc](#) [Next Doc](#) [Go to Doc#](#)☐ [Generate Collection](#) [Print](#)

L7: Entry.52 of 66

File: USPT

Jul 27, 1999

DOCUMENT-IDENTIFIER: US 5929601 A

TITLE: Battery management apparatus for portable electronic devices

Abstract Text (1):

A battery management system preferably has a base station utilized in connection with a portable electronic device for providing electrical therapy to the body of a patient in response to the occurrence of a treatable condition. The portable device can have a rechargeable battery, memory, data processor for determining available operating time for the portable device prior to recharging, and a display panel, or alarm, to inform the patient of such available operating time. The portable device data processor contains an analog to digital converter which is used to obtain and record data regarding the patient, the battery, and the portable device operational status. The base station can have a receptacle to receive the portable device, including a port for transferring data between the memory of the portable device and the base station, a power supply associated with the port for supplying charging current to the battery, a computer for exchanging information with the portable device memory, and a battery maintenance portion. The maintenance portion can perform tests on the battery to evaluate the condition thereof. The base station can further include a display and alarms to inform the patient regarding the condition of both the battery and the portable device. The portable device can also include a converter-defibrillator and a second battery maintenance portion which can operate independently of the base station. Tests can be performed, during operation of the portable device, to evaluate the condition of the battery while the portable device is separated from the base station.

[Previous Doc](#) [Next Doc](#) [Go to Doc#](#)

[First Hit](#) [Fwd Refs](#)[Previous Doc](#) [Next Doc](#) [Go to Doc#](#)

Generate Collection

Print

L7: Entry 52 of 66

File: USPT

Jul 27, 1999

US-PAT-NO: 5929601

DOCUMENT-IDENTIFIER: US 5929601 A

TITLE: Battery management apparatus for portable electronic devices

DATE-ISSUED: July 27, 1999

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kaib; Thomas E.	North Huntingdon	PA		
Donnelly; Edward J.	Allison Park	PA		
Connors; Norman J.	Monroeville	PA		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Lifecor, Inc.	Pittsburgh	PA			02

APPL-NO: 08/ 995713 [\[PALM\]](#)

DATE FILED: December 22, 1997

INT-CL: [06] [H01 M 10/46](#)

US-CL-ISSUED: 320/113

US-CL-CURRENT: [320/113](#)

FIELD-OF-SEARCH: 320/106, 320/110, 320/113, 320/115, 320/125, 320/130, 320/132, 320/133, 320/134, 320/136, 320/FOR 101, 320/FOR 104, 320/FOR 120, 320/FOR 138, 600/515, 600/518, 600/523

PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

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	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<a href="#">4080558</a>	March 1978	Sullivan	320/39
<input type="checkbox"/>	<a href="#">4296755</a>	October 1981	Judell	128/705
<input type="checkbox"/>	<a href="#">4432375</a>	February 1984	Angel et al.	128/705
<input type="checkbox"/>	<a href="#">4473078</a>	September 1984	Angel	128/419
<input type="checkbox"/>	<a href="#">4919144</a>	April 1990	Vandehey	128/705
<input type="checkbox"/>	<a href="#">5225763</a>	July 1993	Krohn et al.	320/115 X
<input type="checkbox"/>	<a href="#">5306956</a>	April 1994	Ikeda et al.	320/113 X
<input type="checkbox"/>	<a href="#">5411537</a>	May 1995	Munshi et al.	607/33
<input type="checkbox"/>	<a href="#">5470343</a>	November 1995	Fincke et al.	607/5

<input type="checkbox"/> <u>5483165</u>	January 1996	Cameron et al.	324/427
<input type="checkbox"/> <u>5606242</u>	February 1997	Hull et al.	320/106
<input type="checkbox"/> <u>5619117</u>	April 1997	Koenck	320/135 X
<input type="checkbox"/> <u>5625291</u>	April 1997	Brink et al.	320/131 X

ART-UNIT: 288

PRIMARY-EXAMINER: Tso; Edward H.

ATTY-AGENT-FIRM: Buchanan Ingersoll, P.C.

## ABSTRACT:

A battery management system preferably has a base station utilized in connection with a portable electronic device for providing electrical therapy to the body of a patient in response to the occurrence of a treatable condition. The portable device can have a rechargeable battery, memory, data processor for determining available operating time for the portable device prior to recharging, and a display panel, or alarm, to inform the patient of such available operating time. The portable device data processor contains an analog to digital converter which is used to obtain and record data regarding the patient, the battery, and the portable device operational status. The base station can have a receptacle to receive the portable device, including a port for transferring data between the memory of the portable device and the base station, a power supply associated with the port for supplying charging current to the battery, a computer for exchanging information with the portable device memory, and a battery maintenance portion. The maintenance portion can perform tests on the battery to evaluate the condition thereof. The base station can further include a display and alarms to inform the patient regarding the condition of both the battery and the portable device. The portable device can also include a converter-defibrillator and a second battery maintenance portion which can operate independently of the base station. Tests can be performed, during operation of the portable device, to evaluate the condition of the battery while the portable device is separated from the base station.

30 Claims, 5 Drawing figures

[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)



[First Hit](#) [Fwd Refs](#)[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

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L7: Entry 43 of 66

File: USPT

Feb 19, 2002

DOCUMENT-IDENTIFIER: US 6349221 B1

TITLE: Display for a portable device

Abstract Text (1):

A portable device, for example a portable phone (1), has a display comprising a first element (2) and a second element (3). The first element (2) is adapted to display information, and the second element (3) is an electrochromic element, which at least partially covers the first element (2). This has the advantage of allowing the electrochromic window to enhance the design flexibility of the display. In addition, the display enables power consumption to be saved in a portable device having such first and second elements, by switching off the first display element when the device is placed into a standby mode, and switching the electrochromic element into a non-transparent state to indicate that it is in said standby mode. The device may also be used with other portable devices such as a personal organizer or laptop computer.

[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

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L7: Entry 43 of 66

File: USPT

Feb 19, 2002

US-PAT-NO: 6349221

DOCUMENT-IDENTIFIER: US 6349221 B1

TITLE: Display for a portable device

DATE-ISSUED: February 19, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Wolf; Mats Erik	Sodra Sandby			SE
Von Scheele; Claes Henry	Cary	NC		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Telefonaktiebolaget LM Ericsson (publ)	Stockholm			SE	03

APPL-NO: 09/ 333654 [\[PALM\]](#)

DATE FILED: June 16, 1999

## FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
GB	9813116	June 17, 1998

INT-CL: [07] [H04 B 1/38](#), [G09 G 3/38](#)

US-CL-ISSUED: 455/566; 455/574, 455/575, 455/90, 455/351, 345/105, 345/6

US-CL-CURRENT: [455/566](#); [345/105](#), [345/6](#), [455/351](#), [455/574](#), [455/575.1](#)

FIELD-OF-SEARCH: 455/566, 455/574, 455/575, 455/90, 455/347, 455/351, 345/4, 345/105, 345/87, 345/169, 345/5

PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

[Search Selected](#)[Search All](#)[Clear](#)

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/>	<a href="#">4154512</a>	May 1979	Rode	351/265
<input type="checkbox"/>	<a href="#">5465401</a>	November 1995	Thompson	455/566
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<input type="checkbox"/>	<a href="#">5734628</a>	March 1998	Akasaka	368/232
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95/34088	December 1995	WO	

ART-UNIT: 2683

PRIMARY-EXAMINER: Trost; William

ASSISTANT-EXAMINER: Perez-Gutierrez; Rafael

ATTY-AGENT-FIRM: Burns, Doane, Swecker &amp; Mathis, L.L.P.

## ABSTRACT:

A portable device, for example a portable phone (1), has a display comprising a first element (2) and a second element (3). The first element (2) is adapted to display information, and the second element (3) is an electrochromic element, which at least partially covers the first element (2). This has the advantage of allowing the electrochromic window to enhance the design flexibility of the display. In addition, the display enables power consumption to be saved in a portable device having such first and second elements, by switching off the first display element when the device is placed into a standby mode, and switching the electrochromic element into a non-transparent state to indicate that it is in said standby mode. The device may also be used with other portable devices such as a personal organizer or laptop computer.

22 Claims, 2 Drawing figures

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L7: Entry 40 of 66

File: USPT

Dec 10, 2002

DOCUMENT-IDENTIFIER: US 6493747 B2

TITLE: MULTI-TIER DATA ACQUISITION AND MANAGEMENT SYSTEM COMPRISING AT LEAST ONE TOUCH-SCREEN ENABLED PORTABLE COMPUTING DEVICE OPERABLY COUPLED TO COMPUTERS VIA WIRELESS COMMUNICATION FOR ACCESSING DATA RECORDS STORED IN LOCAL DATABASES COUPLED TO THE COMPUTERS

Abstract Text (1):

A multi-tiered data acquisition and management system including at least two input computers, operably coupled via a communication link, each coupled to a respective local database of data records. The system includes at least two portable computing devices, each operably coupled to one of the two input computers via a wireless communication channel for accessing the data records of the local databases of the input computers. Each portable computing device comprises a CPU, memory, and a touch sensitive display device that cooperate to display multiple virtual regions (which comprise on a data I/O screen and sense location of contact by a user in these virtual regions to thereby provide for user input). These multiple virtual regions preferably include one of a virtual keypad for entering symbols associated with keys of the keypad, at least one scroll bar, at least one rolling key, multiple icons, a menu screen and a graphing screen. Each portable computer may have an integrated code reader (for example, bar code reader) for data entry. The information acquired and maintained by the system may include product information, information identifying a medical patient, or information related to a medical patient (such as personal information gathered upon admittance for care, information related to past medical history of the medical patient, and information related to vital statistics of the medical patient). In addition, each portable device may include a message notification mechanism that notifies the user of receipt of a message from one of the input computers over the respective wireless communication channels.

[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

[First Hit](#) [Fwd Refs](#)[Previous Doc](#) [Next Doc](#) [Go to Doc#](#)☐ [Generate Collection](#) [Print](#)

L7: Entry 40 of 66

File: USPT

Dec 10, 2002

US-PAT-NO: 6493747

DOCUMENT-IDENTIFIER: US 6493747 B2

TITLE: MULTI-TIER DATA ACQUISITION AND MANAGEMENT SYSTEM COMPRISING AT LEAST ONE TOUCH-SCREEN  
ENABLED PORTABLE COMPUTING DEVICE OPERABLY COUPLED TO COMPUTERS VIA WIRELESS COMMUNICATION FOR  
ACCESSING DATA RECORDS STORED IN LOCAL DATABASES COUPLED TO THE COMPUTERS

DATE-ISSUED: December 10, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Simmon; Arnulf	Bozeman	MT		
Donahue; Brett	Bozeman	MT		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Metrologic Instruments, Inc.	Blackwood	NJ			02

APPL-NO: 09/ 823326 [\[PALM\]](#)

DATE FILED: March 30, 2001

## PARENT-CASE:

RELATED CASES This Application is a Continuation of U.S. application Ser. No. 09/241,214 filed Feb. 1, 1999, now U.S. Pat. No. 6,389,477; which is a Continuation of U.S. application Ser. No. 08/196,452 filed Feb. 14, 1994, now U.S. Pat. No. 5,867,688. Each said patent application is assigned to and commonly owned by Metrologic Instruments, Inc. of Blackwood, N.J., and is incorporated herein by reference in its entirety.

INT-CL: [07] [G06 F 13/00](#)

US-CL-ISSUED: 709/208

US-CL-CURRENT: [709/208](#)

FIELD-OF-SEARCH: 709/200, 709/201, 709/208, 709/211, 709/212, 709/216, 709/217

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

[Search Selected](#) [Search All](#) [Clear](#)

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ART-UNIT: 2152

PRIMARY-EXAMINER: Harrell; Robert B.

ATTY-AGENT-FIRM: Perkowski, Esq., P.C.; Thomas J.

ABSTRACT:

A multi-tiered data acquisition and management system including at least two input computers, operably coupled via a communication link, each coupled to a respective local database of data records. The system includes at least two portable computing devices, each operably coupled to one of the two input computers via a wireless communication channel for accessing the data records of the local databases of the input computers. Each portable computing device comprises a CPU, memory, and a touch sensitive display device that cooperate to display multiple virtual regions (which comprise on a data I/O screen and sense location of contact by a user in these virtual regions to thereby provide for user input). These multiple virtual regions preferably include one of a virtual keypad for entering symbols associated with keys of the keypad, at least one scroll bar, at least one rolling key, multiple icons, a menu screen and a graphing screen. Each portable computer may have an integrated code reader (for example, bar code reader) for data entry. The information acquired and maintained by the system may include product information, information identifying a medical patient, or information related to a medical patient (such as personal information gathered upon admittance for care, information related to past medical history of the medical patient, and information related to vital statistics of the medical patient). In addition, each portable device may include a message notification mechanism that notifies the user of receipt of a message from one of the input computers over the respective wireless communication channels.

27 Claims, 23 Drawing figures

[Previous Doc](#)

[Next Doc](#)

[Go to Doc#](#)

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L1: Entry 1 of 1

File: PGPB

Dec 30, 2004

PGPUB-DOCUMENT-NUMBER: 20040268004

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040268004 A1

TITLE: Always-on removable communicator display

PUBLICATION-DATE: December 30, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Oakley, Nicholas W.	Portland	OR	US	

APPL-NO: 10/ 608695 [PALM]

DATE FILED: June 27, 2003

INT-CL: [07] G06 F 13/00

US-CL-PUBLISHED: 710/303

US-CL-CURRENT: 710/303

REPRESENTATIVE-FIGURES: 3C

## ABSTRACT:

A computer system includes a primary display and a secondary display. The secondary display is coupled to a portable device. Information displayed on the secondary display includes information transmitted by the computer system via a short-range communication channel.

[Previous Doc](#)      [Next Doc](#)      [Go to Doc#](#)



US-PAT-NO: 6608551

DOCUMENT-IDENTIFIER: US 6608551 B1

TITLE: Low-cost radio replacement utilizing RFID technology

----- RWIC -----

## Brief Summary Text - BSTX (6):

The use of a conventional bi-directional radio of these prior art systems has certain drawbacks. For example, the radio can be relatively expensive, especially in terminals designed for simple, short range wireless communication. Further, the terminal's battery, in addition to powering the terminal's data collection facilities, must also provide power sufficient to transmit and receive radio signals to and from the host computer, resulting in additional drain on the battery. A further drawback is that these radio systems often use a licensed frequency band requiring Federal Communications Commission ("FCC") approval.

## Brief Summary Text - BSTX (10):

The wireless data communications system further includes at least one RFID interrogator connected to a host computer. In operation, the RFID interrogator polls for RFID tags, and when an RFID tag is detected, the data stored in the memory of the portable device may be uploaded to the RFID interrogator through the RFID tag. Likewise, data could be downloaded to the data collection terminal via the same RFID interrogator. The data downloaded to the portable device could include visual display data for use on the display of the portable device, audio data for playback over a speaker of the portable device, executable code to customize the processing logic of the portable device, data to be used in subsequent processing by the portable device, and other types of data.



US06608551B1

(12) United States Patent  
Anderson et al.

(20) Patent No.: US 6,608,551 B1  
(45) Date of Patent: Aug. 19, 2003

(54) LOW-COST RADIO REPLACEMENT  
UTILIZING RFID TECHNOLOGY

(75) Inventors: James A. Anderson, Everett, WA (US);  
Christopher A. Wilkie, Everett, WA  
(US)

(73) Assignee: Intermec IP Corp., Woodland Hills, CA  
(US)

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 0 days

(21) Appl. No.: 09/314,341

(22) Filed: Sep. 15, 1999

(31) Int. Cl. .... H04Q 5/22, G06B 5/23

(52) U.S. Cl. .... 340/10.51, 340/572.1,  
340/825.36, 340/10.1

(50) Field of Search: 340/10.51, 10.1,  
340/10.1, 572.1, 7.27, 825.31, 825.49, 825.69,  
825.72, 825.422, 423, 423

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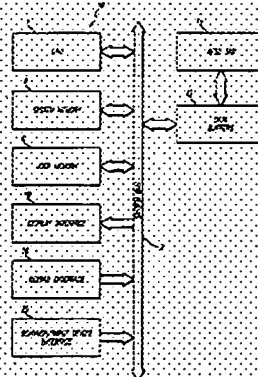
Primary Examiner—Doreen L. Chabane

(74) Attorney, Agent, or Firm—Owen C. Roth

(57) ABSTRACT

A radio replacement using RFID technology as an RF-enabled device is provided. The RF-enabled handheld, portable, or omnidirectional device is equipped with an RFID tag having read and write capability. Data exchange occurs between the RFID tag and a network of RFID interrogators placed to provide adequate coverage of the area over which the device might move. As a result of replacing a full functioning, transmitting/receiving radio with an RFID tag, the cost of the RF-enabled device could be significantly reduced, its battery life could be extended, and it could operate in a frequency band that does not require FCC approval. Additionally, this invention could provide tracking and access control using the RFID tag and interrogators.

20 Claims, 7 Drawing Sheets



US-PAT-NO: 6600902

DOCUMENT-IDENTIFIER: US 6600902 B1

TITLE: Multiple link data object conveying method for conveying data objects to wireless stations

----- KWIC

## Abstract Text - ABSTX (1):

A wireless system comprises a number of wireless stations for communication with each other through short-range wireless links. In a multiple link data object conveying method, in a data conveying session, a first short-range wireless link is set up between a first and a second wireless station of the wireless system. Upon setting up of the first short-range wireless link, first and second personal identification codes are respectively entered in the first and second wireless stations. Thereafter, a data connection through the first wireless link is only set up if the first and second entered personal identification codes are the same. If the data connection is set up the first personal identification code is stored for later use in the session, and the data object is conveyed through the first wireless link. Then, while using the stored first personal identification code, at least a subsequent short-range wireless link is set up from the first wireless station to a third wireless station. After checking whether the third wireless station returned the same personal identification code as the re-used first personal identification code, the same type of data object is conveyed through the subsequent wireless link.

## Brief Summary Text - BSTX (3):

The present invention relates to a method of conveying data objects to wireless stations through short-range wireless links such as radio links, infra-red links, or any other suitable wireless links or combinations of different types of wireless links. The short-range wireless links can be wireless links in accordance with the so-called Bluetooth Specification, or any other suitable short-range wireless link. The wireless stations can be cellular or cordless phones, personal computers, PDAs, laptops, palm pilots, or any other suitable portable devices.

## Brief Summary Text - BSTX (7):

The Bluetooth Specification, "Specification of the Bluetooth System--Core", v1.0A, Jul. 26th, 1999, pp. 41-45 and 47, describes a short-range wireless system. In Bluetooth, the range of a wireless link is typically in the order of a few meters. On page 41, a general description of BT, Bluetooth, a short-range radio link, is given. On page 42, a BT piconet with masters and slaves is shown. On pages 43-45, the BT physical channel, with time slots, is shown. Page 45 describes types of links between masters and slaves, a master being a link initiator, and a slave being the device accessed by the master. In this respect, a master/slave relationship exists between devices when a Bluetooth link is established. Once a link has been established, a



(12) **United States Patent** (50) Patent No.: **US 6,600,902 B1**  
 (45) Date of Patent: **Jul. 29, 2003**

(54) **MULTIPLE LINK DATA OBJECT CONVEYING METHOD FOR CONVEYING DATA OBJECTS TO WIRELESS STATIONS**

(73) Inventor: **John R. Bell, Fremont, CA (US)**  
 (73) Assignee: **Koninklijke Philips Electronics N.V., Eindhoven (NL)**

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/425,638  
 (22) Filed: Oct. 22, 1999

(51) Int. Cl.: **H04B 5/00; H04M 1/68**  
 (52) U.S. Cl.: **455/411; 455/317**  
 (53) Field of Search: **455/411, 411, 564, 455/357, 410, 517; 150/247, 270**

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"Specification of the Bluetooth System Profile", V1.0A, Jul. 28, 1999.

Veard and Volden, Website [HTTP://WWW.WMCC.ORG](http://www.wmcc.org), PDU, Oct. 18, 1999.

\* cited by examiner

Primary Examiner—William Ross  
 Assistant Examiner—Richard Penn-Chickens  
 (74) Attorney, Agent or Firm—Kevin Simons

(57) **ABSTRACT**

A wireless system comprises a number of wireless stations for communication with each other through short-range wireless links. In a multiple link data object conveying method, in a data conveying session, a first short-range wireless link is set up between a first and a second wireless station of the wireless system. Upon setting up of the first short-range wireless link, first and second personal identification codes are respectively obtained in the first and second wireless stations. Thereafter, a data connection through the first wireless link is only set up if the first and second personal identification codes are the same. If the data connection is set up for the first personal identification code is stored for later use in the session, and the data object is conveyed through the first wireless link. Then, while using the stored first personal identification code, at least a subsequent short-range wireless link is set up from the first wireless station to a third wireless station. After checking whether the third wireless station obtained the same personal identification code as the received first personal identification code, the same type of data object is conveyed through the subsequent wireless link.

18 Claims, 2 Drawing Sheets

